Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Office of Engineering and Technology Seeks	)	ET Docket No. 17-340
Comment on Technological Advisory Council	)	
Spectrum Policy Recommendations	)	

COMMENTS OF INMARSAT, INTELSAT CORPORATION, IRIDIUM CONSTELLATION LLC, SES AMERICOM, INC., AND TELESAT CANADA

Inmarsat, Intelsat Corporation, Iridium Constellation LLC, SES Americom, Inc., and Telesat Canada (collectively, the "Satellite Parties") hereby respond to the above captioned Public Notice,[1] which seeks comment on implementing the principles developed by the FCC's Technological Advisory Council ("TAC") in its Basic Spectrum Principles[2] document to address interference.

The Satellite Parties note that the purpose of the Public Notice is unclear but believe, as set out in more detail below, that the Commission's rules and processes do not need to be revised to implement the TAC principles. If the Commission nevertheless determines that certain principles should be considered for implementation via changes in its rules and processes, such changes must be the subject of a rulemaking proceeding.[3] A full review would be necessary because the TAC recommendations are based on broadly stated spectrum principles, and

[1] Office of Engineering and Technology Seeks Comment on Technological Advisory Council Spectrum Policy Recommendations, Public Notice DA 17-1165, released Dec. 1, 2017 ("Public Notice").
[2] December 2015 paper "Basic Principles for Assessing Compatibility of New Spectrum Allocations", *available at* https://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting121015/Principles-White-Paper-Release-1.1.pdf ("*White Paper*").
[3] *See* Administrative Procedures Act, 5 U.S.C. §553.

whatever elements of those principles the Commission decides to reflect in its rules and processes would have to be examined in the context of specific facts and frequencies. Additionally, the Satellite Parties emphasize that the Commission must leave itself the flexibility to deviate from these principles as circumstances warrant.

I. MANY OF THE TAC PRINCIPLES ARE ALREADY IMPLEMENTED IN THE COMMISSION'S RULES AND PROCEDURES

The Commission's processes for allowing access to spectrum by different services ("inter-service operations") and licensing operations within a service ("intra-service operations") already implement the most fundamental elements of the TAC's recommendations. Specifically, Principle 1, part of Principle 2, and Principles 6, 7, and 8 are already well ingrained in the Commission's processes. These processes, which are intended to ultimately support meaningful commercial service, appropriately balance the need to minimize interference, thereby ensuring successful operations, and the complexity of producing detailed analysis of the potential for interference. Accordingly, the Satellite Parties do not see any need to change the FCC's Part 25 rules related to licensing and operation of satellite and earth stations based on these principles.

For example, all of the Commission's decisions on whether to allow spectrum to be used by a new service or to license an existing service acknowledge that interference is a function of frequency, space and time as set out in Principle 1 of the TAC *White Paper*. Similarly, Section 25.209 reflects Principle 6 by requiring earth station applicants to meet an off-axis gain mask defined by the Commission and intended to reduce unwanted emissions outside of the targeted orbital location, and Section 25.202 defines frequency tolerance and emission limits. Principle 6 is also reflected in the coordination process established by the Commission in Section 25.203, which ensures satellite earth stations that share frequencies with terrestrial services will be designed to minimize the potential for interference.

As a demonstration of Principle 7 at work, the TAC acknowledges that the Commission already requires a substantial amount of information about transmitters to ensure license compliance and to reconcile interference situations.[4] The TAC goes on to suggest that the Commission should gather additional information about receivers and system operations, much of which is proprietary and competitively sensitive information, in order to "decide on the compatibility of neighbor services to avoid harmful interference and also determine who is at fault if harmful interference does occur."[5] The TAC proceeds to propose that the most effective way to use such information to resolve interference among operators would be through a "clearinghouse" repository that would allow operators to engage in private resolution of interference issues. The TAC, however, fails to define the scope of the interference problem it is trying to address with this principle. As the TAC states, current interference "[re]mediation has taken the form of direct negotiation between the transmitting and impacted parties, occasionally with the assistance of the FCC,"[6] but there is no indication that such private negotiations are not working. If there is no problem, there is no need to develop a complicated process to address it. Furthermore, the TAC fails to explain how the risk of sharing such sensitive information and the cost of implementing such a repository is balanced in favor of any benefit it would impart.

The Commission also applies Principle 8 on a discretionary basis when establishing interference limits to enhance spectrum sharing among operators. In addition to the two examples cited in the *White Paper*,[7] the Commission has also established interference limits in

[4] *White Paper* at 19.
[5] *Id.*
[6] *Id.*
[7] *Id.* at 20.

several spectrum bands used by geostationary satellites through its two-degree spacing policy.[8] The Satellite Parties agree that interference limits can be useful in certain circumstances to ensure spectrum can be re-used throughout the United States without causing harmful interference. However, interference limits should not be adopted as a necessity in every decision to allow either inter-service or intra-service sharing. Such a requirement would unnecessarily complicate rulemaking proceedings and could potentially restrict use of spectrum beyond what is necessary to avoid harmful interference.

Principle 4 is also implemented on a more limited scale in Section 25.209(c)(1), which limits protection to receiving earth stations that operate within the antenna masks defined in subsections (a) and (b) of the same rule. However, the Satellite Parties do agree with the Commission's general statement: "While the Commission generally regulates transmitters by establishing emission power limits in radio service rules, the Commission generally does not regulate receiver immunity (e.g., filter) performance that vendors are responsible for in principle #4."[9] The Satellite Parties believe that the protection limits set out in Section 25.209(c)(1) represent an appropriate balance between regulation and the receiver operator's responsibility to mitigate interference from other operators, and that there is no need to include additional receiver performance measures in Part 25 of the Commission's rules based on the proposed principles.

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[8] *See Licensing of Space Stations in the Domestic Fixed -Satellite Service and Related Revisions*, CC Docket No. 81-704, Report and Order, 48 FR 40233 (1983); *Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite Service Use*, IB Docket No. 98-172, Report and Order, 15 FCC Rcd 13430 (2000) (18 GHz Report and Order); *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Second Report and Order, FCC 15-167 (2015).

[9] *See* Public Notice at 4.

II. THE COMMISSION SHOULD NOT ADOPT PRINCIPLES THAT WOULD INCREASE REGULATORY OVERSIGHT OR THE COST OF SERVING THE UNITED STATES

The remaining principles proposed by the TAC, part of Principle 2, as well as Principles 3, 5, and 9 represent recommendations beyond simple policy that would (1) greatly increase the need for Commission regulation and oversight of both system design and operation, and (2) increase the cost of operating within the United States.

Principle 3 in the TAC *White Paper* states that "Operators should expect and plan for occasional service degradation or interruption. The Commission should not base its rules on exceptional events."[10] The Satellite Parties agree with the latter portion of this statement, which is consistent with the way the Commission already establishes its rules, and note that system operators already build some amount of service degradation into their service availability objectives.

However, licensees should not be expected to accept interference beyond what is defined by the operating rules set out by the Commission. As described above, the Commission's spectrum use decisions and service licensing processes already implement analyses intended to mitigate inter-service and intra-service interference. The results are service rules that are designed to protect each service and operator to a level deemed appropriate by the Commission. However, as stated in the Executive Summary of the *White Paper*, "modern wireless transmission has become a substitute for wired quality connectivity"[11] and, as such, expectations of availability and quality have been heightened. Operators should not be expected to plan for occasional service degradation or interruption given that the objective of their service is to replace the services provided on high reliability wired connections and that their service could be

[10] *White Paper* at 9.
[11] *Id*. at 3.

relied upon in emergency situations to save lives. Such an approach could undermine the business case for investing in commercial services and possibly limit the functionality of the services that could be offered.

In Principle 2, the TAC suggests that operators' system design should contemplate future expansion in their spectrum by other parties [12] and in Principle 5, the TAC suggests that "Systems are expected to use techniques at all layers of the stack to mitigate degradation from interference."[13] If the Commission chooses to implement these principles, further work is needed to consider the potential impact such an approach could have on the efficient use of spectrum. While the Satellite Parties agree that operators should apply good engineering practice when designing systems to ensure compliance with Commission and international rules, current operators should not be expected to implement costly techniques to combat interference beyond a defined level. Nor should operators be expected to implement such techniques solely for the benefit of a future interfering service of unknown characteristics and date of implementation, or more concerning, for the benefit of a future competitor.

Satellite operators currently do implement several of the techniques outlined in the *White Paper*, but they typically do so to maximize the throughput and capacity of the spectrum they are licensed to use. Operators conduct complicated financial analyses to weigh the cost of implementing these techniques into their satellites and ground systems against the predicted return on that investment. If the Commission were to subsequently require operators to attribute some of the benefit of these techniques to absorb interference from future users of spectrum, it would effectively be transferring value from one user to another.

[12] *Id*. at 8-9.
[13] *Id.* at 15.

The Satellite Parties specifically object to Principle 9, which would require the Commission and stakeholders in a spectrum use proceeding to conduct extensive quantitative analysis of service interactions in order to define an interference protection level.[14] The proposal places the cart before the horse and threatens to inject significant time and cost in developing a new service without improving the process. The appropriate approach when evaluating the introduction of more than one service into a spectrum band is to identify the appropriate acceptable interference levels for each service and then conduct analysis to determine whether and how those levels can be met.

Additionally, the Satellite Parties disagree with the TAC's proposal to require a risk-informed interference assessment ("RIIA") in spectrum use decisions. If the Commission were to implement an RIIA requirement, at a minimum further consideration would need to be given to when and how an RIIA would be conducted.

As an initial matter, RIIA, as described by the TAC, requires specific information including not only the technical characteristics of both the interfering system and the affected system, but also details on the expected deployment and the locations of the two systems, in order to evaluate the likelihood of an interference event. During a proceeding designed to consider use of spectrum by a new service, this level of design detail will likely not be available for the simple reason that new systems that have not been deployed will not be fully technically characterized, nor will installation locations be known. The *White Paper* provides, in Section 5, an example of a notional case where a mobile service is considered for deployment in a satellite uplink band.[15] This example illustrates the complexity of conducting interference analyses in

[14] *Id.* at 23-26.
[15] *Id*. at 29-30.

such a case and notes that elements such as variation in deployment density due to population density, expected traffic density in the near term and expected growth over time, and the variation in loading due to realistic traffic models would be needed to conduct a reasonably accurate RIIA. Such an approach would run counter to recent Commission practice. For example, in the ongoing proceeding to establish the Upper Microwave Flexible Use Service in spectrum above 24 GHz, the Commission repeatedly emphasized the need to encourage flexible use of the band to accommodate innovative future services.[16] As a result, such details as location, number of transmitters or even transmission orientation (down-tilt, etc.) could not be defined at the time of the proceeding.

III. CONCLUSION

For the foregoing reasons, the Satellite Parties believe that the Commission rules and procedures currently reflect the most fundamental elements of the TAC's principles. Should the Commission determine a need to implement the principles in a more formal way, a separate rulemaking proceeding must be conducted to ensure all interested parties have an opportunity to evaluate a specific proposal from the Commission in light of the relevant services and spectrum bands that could be affected.

[16] *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 8014, at ¶ (2016) (adopting a variety of performance metrics "to provide enough certainty to licensees to encourage investment and deployment in these bands as soon as possible, while retaining enough flexibility to accommodate both traditional services and new or innovative services or deployment patterns.").

Respectfully submitted,

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